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**(54) MULTIPLIER****(57) Abstract:**

**PURPOSE:** To obtain  $(8 \times n)$  types of sets of input vectors for detection of the faults of a Wallace tree conversion part consisting of the 1st - n-th conversion parts by using a test mechanism which applies an optional input pattern at every full adder or half adder of each conversion part in accordance with the types of input vectors.

**CONSTITUTION:** In a test mode, the input vectors A and B are secured to equalize the inputs of all full adders of an m-th conversion part ( $1 \leq m \leq n$ ) with a test mechanism. Then the input patterns are inputted to all full adders of the part 3m with the change of both vectors A and B. These input patterns of all full adders are available in eight ways and therefore eight types of sets of vectors A and B are obtained for the detection of the faults of all full adders of the part 3m. Thus,  $(8 \times n)$  types of sets of vectors A and B are obtained for the detection of faults of the Wallace tree conversion part 3 consisting of the 1st

- n-th conversion parts 31-3n.

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